

PATENT CLAIMS

1. A method of compressing a medium in the combustion chamber (15) of a combustion engine, by which method a liquid, in the state of a spray, is introduced into the compression chamber (15) during a compression stroke, and the liquid is pressurized and heated before it is introduced into the compression chamber (15) to such a degree that at least a part of the droplets of the spray explode spontaneously upon entrance in the compression chamber (15), the liquid being pressurized to such an extent that, at the moment of introduction, it has a steam pressure that is above the pressure that, at the moment of introduction, exists in the compression chamber (15), and the liquid being heated to such an extent that, at the moment of introduction, it has a temperature that exceeds the boiling point of the liquid for the temperature and the pressure that, at the moment of introduction, exists in the compression chamber (15), and the liquid being water, **characterized in that** the liquid is heated to such an extent that, at the moment of introduction, it has a temperature that is below the temperature of the medium at the moment of introduction of the liquid.
2. A method of compression of a medium in a compression chamber of a compressor, by which method a liquid, in a state of a spray, is introduced into the compression chamber during a compression stroke, **characterized in that** the liquid is pressurized and heated before being introduced into the compression chamber, to such an extent that at least a part of the droplets of the spray explodes spontaneously upon entrance into the compression chamber.
3. A method according to claim 2, **characterized in that** the liquid is pressurized to such an extent, at the moment of introduction, it has a

steam pressure that is above the pressure that, at the moment of introduction, exists in the compression chamber.

4. A method according to claim 2, **characterized in that** the liquid is
5 heated to such an extent that, at the moment of introduction, it has a temperature that is above the boiling point of the liquid for the temperature and the pressure that, at the moment of introduction, exists in the compression chamber.
- 10 5. A method according to anyone of claims 2-4, **characterized in that** the liquid is heated to such an extent that, at the moment of introduction, it has a temperature that is below the temperature of the medium at the moment of introduction.
- 15 6. A method according to claim 1, **characterized in that**, in a combustion engine, the liquid is introduced through a valve (10) that is used by the combustion engine for the purpose of introduction of fuel.
- 20 7. A method according to claim 6, **characterized in that** the liquid and the fuel are introduced simultaneously.
- 25 8. A method according to anyone of the preceding claims, **characterized in that** a mixture of the previously compressed medium and the vaporized liquid is evacuated after the compression, and in that the liquid, after said evacuation, is separated by means of condensation.
- 30 9. A method according to claim 8, **characterized in that** the liquid is refined from solid contamination and is re-transported to a suitable storing chamber.

10. A method according to anyone of the preceding claims, **characterized in that** the liquid that is introduced is water and that the medium that is compressed in the compression chamber is air.
- 5 11. A method according to claim 1 and 10, **characterized in that** the water is introduced into the cylinder space when the pressure in the latter is equal to or more than 4,5 bar.
- 10 12. A system for controlling a device for the compression of a medium in the compression chamber (15) of a combustion engine or a compressor, by which a liquid, in the state of a spray, is introduced into the compression chamber (15) during a compression stroke, comprising means for pressurizing and heating said liquid and means (10) for introducing the liquid into the compression chamber (15),
- 15 and means (12) for determining the pressure and/or the temperature in the compression chamber (15), **characterized in that** it comprises a control unit (5) that is operatively connected with the means (12) for determining the pressure and/or the temperature and with the means for pressurizing and heating the liquid, and including a computer program which is adapted for the purpose of controlling the means (10) for the introduction of the liquid into the compression chamber (15) upon basis of the information concerning the pressure and the temperature in the compression chamber and in accordance with the method according to anyone of claims 1-11.
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